UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/650,260	08/29/2000	Yao-Ching Liu	16415-0020	9482

32294 7590 12/17/2004

SQUIRE, SANDERS & DEMPSEY L.L.P.
14TH FLOOR
8000 TOWERS CRESCENT
TYSONS CORNER, VA 22182

EXAMINER	
ODLAND, DAVID E	

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/650,260	LIU ET AL.	
	Examiner	Art Unit	
	David Odland	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3-5,11-15,18-20,25,26,32 and 36-40* is/are allowed.

6)☒ Claim(s) *1,2,6-10,16,17,21-24,27-31 and 33-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The following is a response to the amendments filed on 10/24/2004.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,2,6-10,16,17,21-24 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giroux et al. (US 2002/0089933), hereafter referred to as Giroux, in view of Van As et al. (US 5,901,140), hereafter referred to as Van As.

Regarding claims 1, 16 and 27, Giroux discloses a method for detecting and controlling congestion in a multi-port shared memory switch in a communications network. As shown in Fig. 1, the system comprises inputs for receiving data traffic from a plurality of sources (plurality of receive ports). See paragraph 0005. The system also has a shared memory buffer having output queues configured for each of the output ports (a plurality of transport ports. . .a shared memory providing a shared memory space for temporary storage of data packets received via the receive ports). See paragraph 0006. With the output queues, it is inherent that the system will determine to which output port a received packet is destined (determining a destination of the transmit ports associated with said received data packet). The system also includes local congestion monitoring means setting a queue length threshold for each output queue to monitor

output queue length and to provide queue congestion information when the length of any of the output queues exceeds the queue length threshold (determining whether the destination transmit port is currently congested by determining whether a number of packets currently stored in the shared memory that are to be transmitted via said destination transmit port exceeds a predetermined congestion threshold). See paragraph 0007. Giroux et al. also discloses using any congestion control mechanism, like early packet discard, to alleviate the congestion problem if it occurs (dropping the received packet if the destination transmit port is currently congested). See paragraph 0004. Giroux et al. does not expressly disclose determining whether the associated receive port is currently saturated. However, Van As discloses a switching system wherein input ports are monitored for the level of cells that are queued in order to determine if the level exceeds a threshold (see columns 3 and 4)). it would have been obvious to one skilled in the art at the time of the invention to implement this feature into the system of Giroux because doing so would make the system more reliable by preventing input congestion. Note regarding claim 1also that Giroux discloses that a local congestion flag is set when a given output queue exceeds the certain threshold, and the control congestion mechanisms are applied to the connection destined to this queue. It is inherent in this statement that the system produces some sort of signal indicating to the control congestion mechanisms that the output queue has reached the congestion state (generate an associated output 111 signal indicative of whether said associated transmit port is congested). Note regarding claim 16, it is inherent in Giroux et al. that there were some sort of communication signals sent to the receive ports to indicate whether to drop or move the packet to the output queues-the controlling section must have made a decision as to whether or not to retain the packet. Neither Giroux nor Van As expressly discloses generating filter

signals for indicating that a received packet is destined for a congested one of the transmit ports. However, it would have been obvious to generate one of these signals in the combined system of Giroux and Van As. One would have been motivated to do this because sending this filter signal and informing the system that the packet will be dropped if it' s continued to be sent will save on sending resources that could be used for other packets.

Regarding claims 2 and 17, in looking at the computer code disclosed in between paragraphs 0026 and 0027 of Giroux, the variable Output-length (Qi) can be considered a "counter" (an input counter) that is compared against Queue-Threshold (Qi), which be can considered the ("drop threshold" (drop based on a comparison between said input count value am said drop threshold value). Giroux also discloses that the algorithm can be nm as a background process of can be triggered by cell or packet arrival events, so the process can be "enabled" at any time (generate a count enable signal, and to assert the signal). See paragraph 0026.

Regarding claims 6 and 21, as mentioned previously, the computer code disclosed by Giroux has counters that are compared against predetermined threshold values.

Regarding claim 7, ms mentioned previously, it is inherent that transmit signals or drop signal will be generated by the system to indicate which packets to retain and send. This will cause the certain packets to be dropped if the connection is saturated and congested.

Regarding claims 8 and 22, as mentioned previously, the "enable signal" can be invoked at any time because the algorithm of Giroux can be nm at any time.

Regarding claims 9, and 23, as shown in Fig. 1 of Giroux et al., any one of the input ports can be connected to any one of the outputs through the shared memory manager. Giroux et al. does not expressly disclose that the lines are bi-directional, but it would have been obvious to

add queues on the input side, thus making the system symmetrical and bi-directional. One would have been motivated to do this because it would have given the system in Giroux et al. more flexibility when it came to traffic that was flowing in both directions.

Regarding claims 10 and 24, Giroux discloses that the fair share threshold is determined by finding the product of the buffer size and the buffer threshold and dividing the product by the number of output port queues. See paragraph 0011.

Regarding claim 28, Giroux et al. discloses a global congestion monitoring means that provides congestion information if the traffic to the shared memory exceeds the shared memory buffer threshold (determining whether a currently occupied portion of the shared memory space is greater than or equal to a predetermined threshold portion of the memory space). See paragraph 0008. Neither Giroux nor Van As discloses the counting of packets only after it is realized that the occupied portion is great than or equal to the threshold portion or resetting the counter if it's not greater than or equal to the threshold portion. However, it would have been obvious to a person of ordinary skill in the art to do so. One would have been motivated to do this because there is no need to waste resources and keep a count if the level of occupancy is not above the threshold.

Regarding claim 29, it is inherent that the input counter would be increased with each new input and be decreased with each time one of those packets is transmitted.

3. Claims 30, 31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giroux in view of Van As, further in view of Basso et al. (US 5,787,071), hereafter referred to ad Basso, in light of the rejection to claim 27.

Regarding claims 30 and 31, Giroux does not disclose asserting a backpressure signal when a backpressure threshold has been exceeded. However, Basso et al. discloses generating backpressure signals when a threshold has been reached. See col. 2, lines 34-58. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use a backpressure signal if the threshold has been exceeded. One would have been motivated to do this because sometimes the inputs become too aggressive and simply dropping packets would not be the most efficient way of controlling the system (i.e. it would be more efficient to tell the input to slow down its transfers).

Regarding claims 33 and 34, as shown in Fig. 1 of Giroux, any one of the input ports can be connected to any one of the outputs through the shared memory manager. Giroux does not expressly disclose that the lines are bi-directional, but it would have been obvious to add queues on the input side, thus making the system symmetrical and bi-directional. One would have been motivated to do this because it would have given the system in Giroux et al. more flexibility when it came to traffic that was flowing in both directions.

Regarding claim 35, as mentioned previously, Giroux discloses splitting up the memory into equal sections to come up with the thresholds (see figure 1)).

Allowable Subject Matter

4. Claims 3-5,11-15,18-20,25,26,32, and 36-40 are allowed.

Response to Arguments

5. Applicant's arguments with respect to claims 1,16 and 27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Odland whose telephone number is (571) 272-3096. The examiner can normally be reached on Monday - Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached at (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

deo

December 4, 2004

JOHN PEZZLO
PRIMARY EXAMINER